

WHAT IS CLAIMED IS:

1. A nickel alloy including, by mass %, C: 0.01 – 0.04%; Si: 0.05 – 1%; Mn: 0.05 – 1%; P: 0.015% or less; S: 0.015% or less; Cr: 25 – 35%; Ni: 40 – 70%; Al: 0.5% or less; Ti: 0.01 – 0.5%; and the balance Fe and impurities, wherein the crystal structure has a low angle boundary rate of 4% or more as for the grain boundaries.
2. A nickel alloy including, by mass %, C: 0.01 – 0.05%; Si: 0.05 – 1%; Mn: 0.05 – 1%; P: 0.02% or less; S: 0.02% or less; Cr: 10 – 35%; Ni: 40 – 80%; Al: 2% or less; Ti: 0.5% or less; and the balance Fe and impurities, wherein the crystal structure has a low angle boundary rate of 4% or more as for the grain boundaries.
3. A nickel alloy according to Claim 2, further including at least one of Co: 2.5% or less; Cu: 1% or less; Nb + Ta: 3.15 – 4.15%; Mo: 8 – 10%; and V: 0.035% or less.
4. A method for manufacturing a nickel alloy including, by mass %, C: 0.01 – 0.04%; Si: 0.05 – 1%; Mn: 0.05 – 1%; P: 0.015% or less; S: 0.015% or less; Cr: 25 – 35%; Ni: 40 – 70%; Al: 0.5% or less; Ti: 0.01 – 0.5%; and the balance Fe and impurities, said method comprising a step of cold working the alloy, wherein the final cold working is carried out at an area reduction rate of 60% or more.
5. A method for manufacturing a nickel alloy including, by mass %, C: 0.01 – 0.05%; Si: 0.05 – 1%; Mn: 0.05 – 1%; P: 0.02% or less; S: 0.02% or less; Cr: 10 – 35%; Ni: 40 – 80%; Al: 2% or less; Ti: 0.5% or less; and the balance Fe and impurities, said method comprising steps of cold working the alloy, wherein the following two equations (1) and (2) are fulfilled:

$$R_d \geq 40 \quad \dots \quad (1)$$

$$R_d \times (0.1 + 1/\exp(T/500)) \geq 10 \quad \dots \quad (2)$$

where  $R_d$  (%) is an area reduction rate in the final cold working, and  $T(^{\circ}\text{C})$  is the temperature in the final solution treatment.

6. A method for manufacturing a nickel alloy according to Claim 4 or 5, wherein the cold working applied to the nickel alloy is the cold rolling.

7. A method for manufacturing a nickel alloy according to Claim 5, wherein said nickel alloy further includes at least one of Co: 2.5% or less; Cu: 1% or less; Nb + Ta: 3.15 – 4.15%; Mo: 8 – 10%; and V: 0.035% or less.

8. A method for manufacturing a nickel alloy according to Claim 7, wherein, the cold working applied to the nickel alloy is the cold rolling.